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(54) Printing press cylinder dressing foil

(57) During the passage of the sheet through a printing press, the freshly printed side of the sheet comes into direct contact with the sheet-transfer cylinders; in perfecting, after the turn, the freshly printed side of the sheet is additionally pressed onto the impression cylinders of the following printing units. In order, nevertheless, to be able to print to a consistently high quality, it must be ensured that there is as little buildup as possible of printing ink on the outer cylindrical surfaces of sheet-transfer cylinders and impression cylinders. A sheet-guiding foil (2) as dressing for such cylinders is therefore proposed. The surface (1) of said foil is textured (3) and is provided with an oleophobic, wear-resistant and incompressible silicone layer. The good ink-removal characteristics of the foil result in a minimal buildup of ink on the sheet-transfer and impression cylinders.

Fig. 1

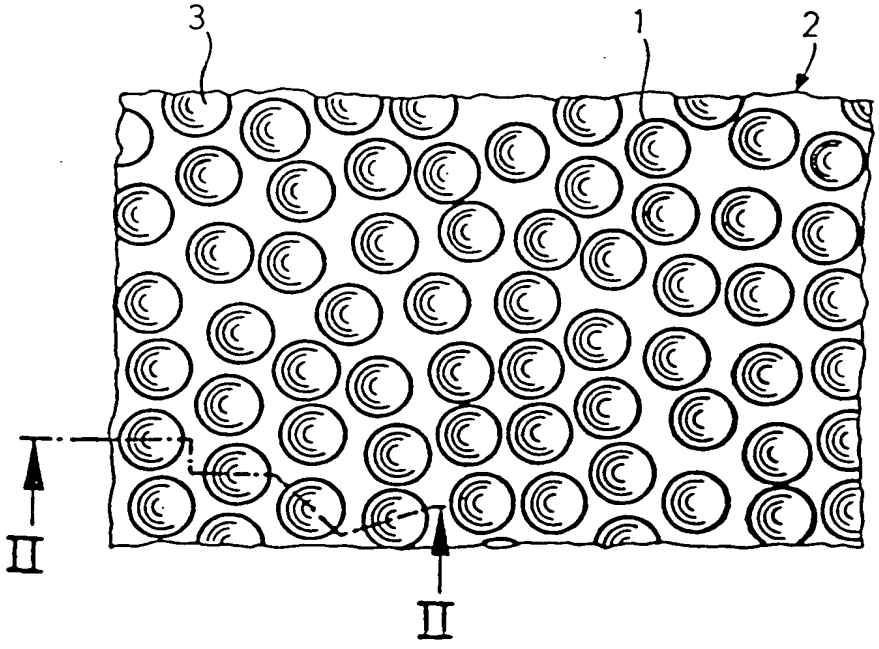

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Fig. 1

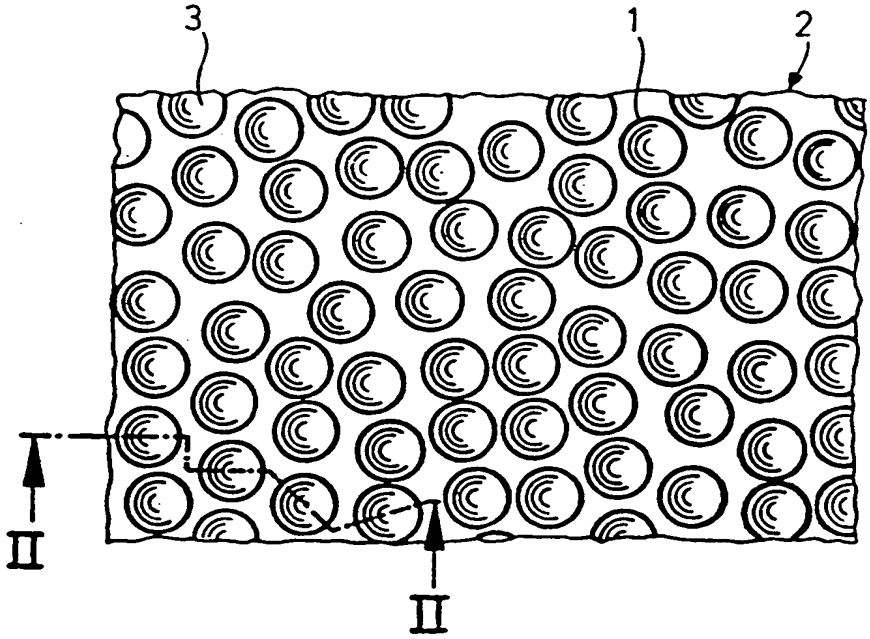
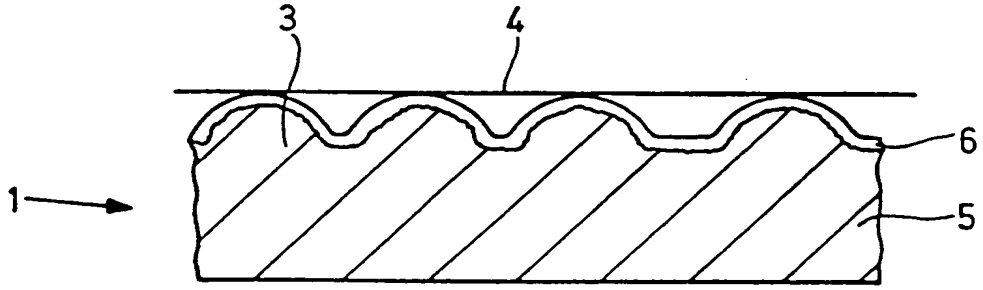


Fig. 2



DESCRIPTION

PRINTING PRESS CYLINDER DRESSING FOIL

The invention relates to a sheet-guiding foil according to the defining clause of claims 1 and 2.

In perfecting, after the turn, the freshly printed, still damp side of the sheet is pressed onto the sheet-guiding surfaces of the impression cylinders of the following printing units. It is of decisive importance with regard to a consistently high print quality that there should be as little buildup as possible of ink on the outer cylindrical surfaces of the following impression cylinders and sheet-transfer cylinders.

Various efforts have been undertaken to create a cylinder jacket with as low an ink acceptance as possible and with the optimum possible ink-removal characteristics. An outstanding example is the cylinder dressing described in DE-PS 24 46 188: the sheet-guiding outer cylindrical surface of backpressure cylinders or sheet-transfer cylinders in rotary printing presses has a texture in the form of spherical cups. The spherical cups are of equal height and are statistically distributed over the surface of the cylinder dressing. The surface texturing itself serves to reduce the backpressure area and thus to reduce the contact area during verso printing. The equal height of the spherical cups creates a uniform backpressure area, while the statistically uniform distribution of the spherical cups counteracts the risk of the formation of moiré patterns in the printed product.

In order to minimize ink acceptance from the outset, nickel is used as the foil material. Nickel has the required physical and chemical characteristics: it is ink-repellent, wear-resistant and extensively chemically resistant to the chemicals used in a printing press.

An improvement to said cylinder dressing is proposed in DE-OS 29 16 505: a thin chromium layer, compensating for the micro-roughness, is additionally applied to the textured surface of a substrate layer made from resistant, non-wearing and inflexible material, said substrate layer having good ink-removal characteristics (nickel for example). Firstly, this extends the service life of the foil by the life of the chromium layer, and, secondly, the cleaning of the foil, which is necessary at certain intervals, is facilitated by its smoother surface.

It has been shown in practice that the ink-removal characteristics of chromium and nickel are particularly pronounced after the cylinder dressing has been treated with a plate cleaner. Further experiments in this direction confirm that the "ink-repellent" properties of these metals occur only in conjunction with the addition of fountain solution, which is indispensable in offset printing.

The object of the present invention is to create a cylinder dressing for an impression cylinder, said cylinder dressing preventing the buildup of ink both by its surface texture and also by the low surface tension of the coating material.

The object of the invention is achieved by the characterizing part of claims 1 and 2.

The low ink-acceptance and good ink-removal characteristics of a surface are dependent both on the texturing of the surface and also on the choice of material for the surface. The proven texturing of the cylinder dressing in the form of spherical cups of equal height statistically uniformly distributed over the surface has been chosen for the invention. Such texturing is particularly advantageous if the foil is used as the dressing for an impression cylinder. A further feature of the invention is that the sheet-guiding surface is roughened (for example by sand-blasting). Both types of texturing serve to reduce the surface area and thus to reduce the contact area between the freshly printed side of the sheet and the outer cylindrical surface of the cylinder. Apart from the already described advantages of the texturing of the cylinder dressing, the material of the dressing plays an important role with regard to the desired poor ink-acceptance and good ink-removal characteristics. These desired properties are all the more pronounced, the lower is the surface tension of the coating material. Therefore, silicone has been selected. The surface tension of silicone is only about half that of chromium.

This property of silicone is known. As becomes apparent from UGRA Reports No. 1, 1984, silicone-rubber printing plates are used in waterless offset printing. In waterless offset printing, it is possible to achieve satisfactory printing results only if the surface tension of the non-image areas, which, after exposure, still bear the original coating of silicone-rubber, is low and if the polar constituents of the non-image areas and of the printing inks are more or less identical. This printing process can, therefore, be performed only with the use of special inks.

Silicone also has the advantage that its chemical and physical properti s can, within broad limits, be modified. The following features essential to the invention should be stressed in this respect: resistance to wear, chemical resistance to the chemicals used in the printing process, and incompressibility - a basic requirement for the use of silicone as a coating material for impression cylinders.

As an advantageous embodiment, it is provided that nickel, chromium or plastic is used as the substrate material. The application of the silicone coating to the textured foil has the advantage that the smoother surface can be cleaned faster and better than the slightly rougher substrate layer.

In an advantageous embodiment of the invention, a silicone coating is additionally applied to a plurality of substrate layers made of oleophobic materials (chromium or nickel for example). In addition to the greater stability, this provides a considerable increase in the service life of the foil. Good ink-removal characteristics are maintained even when areas of the silicone layer have been worn away.

A further embodiment provides that the spherical cups, or the roughened surface, are an integral part of a silicone foil, with the sheet-guiding foil being fixed directly on the impression cylinder or being adapted to be clamped on the impression cylinder through the intermediary of a clamping device.

The invention is explained in greater detail in the following on the basis of a specimen embodiment with reference to the drawings, in which:

Fig. 1 shows a detail of the textured surface of a sheet-carrying foil according to th invention; and

Fig. 2 shows section II, II through said detail of the foil.

Shown in Fig. 1 is a top view of the textured surface 1 of the sheet-guiding foil 2. The texture of the sheet-guiding foil 2 is caused by the spherical cups 3, which are statistically uniformly distributed over the surface. Statistically uniformly means that, on average, there is the same number of spherical cups 3 in each unit of area. Since the distribution of the spherical cups 3 on the sheet-guiding foil 2 is uniform only from the statistical point of view, this texturing of the surface counteracts the formation of moiré patterns in the printed product. The precisely uniform distribution of the spherical cups 3 per unit of area harbours the danger that the points of contact with the uniformly distributed halftone dots of the printed image will be superimposed in such a manner that there is the formation of patterns in the printed product.

As can be seen from Fig. 2, the spherical cups 3 are all of equal height. The tips of the spherical cups 3 form a uniform backpressure surface 4, since they represent an excellent support for the sheet, which is to be printed on the other side. This arrangement of the spherical cups 3 also prevents the premature wear of protruding carrying surfaces.

As can be seen from Fig. 2, the sheet-guiding foil 2 consists of two layers, namely the substrate layer 5, which consists of ither nickel, chromium or plastic, and a silicone coating 6. This embodiment of the

invention has the advantage that the surface is considerably smoother than the substrate layer 5, which is originally formed, for example, from a glass-bead blanket. It is guaranteed that, from the start of use, consistently good ink-removal characteristics are achieved with such a sheet-carrying foil 2.

As will be appreciated, the features referred to in the present description and claims as "cups" are generally dome-like features capable of being regarded as cups disposed in a bottoms-up orientation with respect to the substrate concerned.

PARTS LIST

1	Textured surface
2	Sheet-guiding foil
3	Spherical cup
4	Backpressure area
5	Substrate layer
6	Silicone coating

It will be understood that the invention has been described above purely by way of example, and that various modifications of detail can be made within the ambit of the invention.

CLAIMS

1. A foil suitable for use as a dressing for backpressure cylinders and sheet-transfer cylinders in sheet-fed offset printing presses capable of being employed for perfecting, wherein:

the sheet-carrying surface of the foil is textured in that it is provided with statistically substantially uniformly distributed spherical cups of substantially equal height;

the foil comprises at least one chemically resistant wear-resistant and substantially incompressible substrate layer;

and a silicone coating is applied to the textured surface of the substrate layer.

2. A foil suitable for use as a dressing for backpressure cylinders and sheet-transfer cylinders in sheet-fed offset printing presses capable of being employed for perfecting, wherein:

the sheet-carrying surface of the foil is textured in that it is roughened;

the foil comprises at least one chemically resistant wear-resistant and substantially incompressible substrate layer;

and a silicone coating is applied to the textured surface of the substrate layer.

3. A foil according to claim 1 or 2, wherein the substrate layer comprises chromium, nickel or another oleophobic material.

4. A foil according to claim 1 or 2, wherein the substrate layer comprises a plastics material.

5. A foil according to claim 1 or 2, wherein the foil substrate is itself composed of a silicone.

6. A foil according to claim 1 or 2, wherein a silicone coating is additionally applied to two substrate layers composed of nickel and chromium.

7. A foil according to any of the preceding claims, which foil is fixed on the cylinder concerned directly or through the intermediary of a clamping device.

8. A foil according to claim 1, substantially as described with reference to the accompanying drawing.

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